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PATENT ABSTRACTS OF JAPAN

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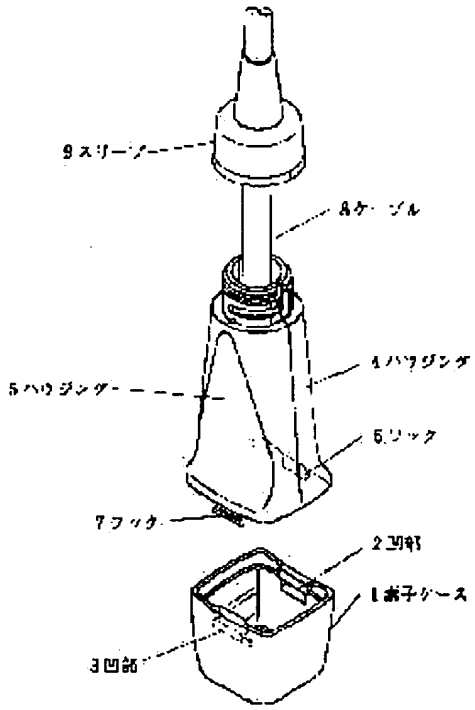
(54) ULTRASONIC PROBE

(57)Abstract:
PROBLEM TO BE SOLVED: To integrally fix an element case wrapping an ultrasonic probe and a housing of a grip part without using a clamp part such as screw.
SOLUTION: Recessed parts 2 and 3 are formed at an opening part of an element case 1, hooks 6 and 7 are formed respectively at each one end part of housings 4 and 5 and the hook 6 is fitted into the recessed part 2 while the hook 7 into the recessed part 3 to integrate the element case 1, the housing 4 and the housing 5. A sleeve 9 is fitted into other end parts of the housings 4 and 5 to prevent the separation of the housing 4 and the housing 5. This achieves an integration of an ultrasonic probe without using any clamp part separately.



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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The decomposition perspective view of the ultrasound probe in the gestalt of operation of this invention
[Drawing 2] The sectional view of the important section of the gestalt of this operation
[Drawing 3] The perspective view showing the appearance of the gestalt of this operation
[Drawing 4] The perspective view showing the appearance of the conventional ultrasound probe
[Drawing 5] The perspective view showing the appearance of other conventional ultrasound probes
[Description of Notations]
1 Component Case
2 Three Crevice
4 Five Housing
6 Seven Hook
8 Cable
9 Sleeve

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the ultrasound probe used for the ultrasonic diagnostic equipment used for a medical-application diagnosis.
[0002]
[Description of the Prior Art] Conventionally, as this kind of an ultrasound probe, it is indicated by JP,61-87537,A and the thing of a configuration as shown in drawing 4 and drawing 5 is known. In drawing 4 , the case 41 and case 42 which countered mutually are fixed to one with the stop screw 43, and the upper limit section of a case 41 and a case 42 is being fixed by the sleeve 45 which the cable penetrated. Moreover, the conventional ultrasound probe shown in drawing 5 piles up the upper case 51 and the bottom case 52, and is fixed and unified with the stop screw 53.
[0003]
[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional ultrasound probe, it was needed separately in conclusion components, such as a stop screw, and there was a problem that receive constraint in an appearance configuration, or a configuration became large beyond the need, the purpose for spending was restricted, and operability also fell. Moreover, there was a fall of leakage current resistance or a problem from which an electric insulation becomes difficult by using metal components called a stop screw. Furthermore, conclusion components were exposed to the case front face, and there was a disadvantage problem which will be shot about appearance in appearance.

[0004] This invention aims at offering the outstanding ultrasound probe which the above-mentioned conventional problem is solved, it can miniaturize without an appearance configuration becoming large, without conclusion components being exposed to a case front face while a case is firmly [certainly and] fixable, and electric safety is obtained, and does not receive constraint of the purpose for spending.
[0005]
[Means for Solving the Problem] This invention is equipped with the housing member of the pair which a projected part is formed in one end face, and faces on one side face mutually, the component case where the crevice into which the above-mentioned projected part fits was formed when an ultrasonic transmission-and-reception wave component was contained inside and one end face of the housing member of a top Norikazu pair joined to opening, and the sleeve that fits into the other-end side of the housing member of the above-mentioned pair in order to solve the above-mentioned technical problem.
[0006] Thereby, while a component case is firmly [certainly and] fixable to a housing member, the ultrasound probe which does not need components separately for conclusion, makes a miniaturization possible, and does not receive constraint of the purpose for spending is obtained.
[0007]
[Embodiment of the Invention] The housing member of the pair which a projected part is formed in one end face, and invention of this invention according to claim 1 faces on one side face mutually, The component case where the crevice into which the above-mentioned projected part fits was formed when an ultrasonic transmission-and-reception wave component was contained inside and one end face of the housing member of a top Norikazu pair joined to opening, While being able to fix a component case to a housing member certainly and firmly, without having the sleeve which fits into the other-end side of the housing member of a top Norikazu pair, and using metal conclusion components High

dielectric strength is securable, and further, since conclusion components are not exposed to an appearance case front face, a miniaturization is made possible and it has an operation of not receiving constraint of the purpose for spending.
[0008] Moreover, invention according to claim 2 has the die length from which the projected part formed in one end face of the housing member of a pair differs, respectively, and in case it inserts a housing member in a component case and is fixed, it has an operation that it is easily and certainly fixable, without mistaking the attachment direction.
[0009] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.
(Gestalt of operation) Drawing 1 is the decomposition perspective view showing the configuration of the ultrasound probe in the gestalt of this operation. Drawing 2 is an important section sectional view, and drawing 3 is the perspective view showing the appearance of an ultrasound probe.
[0010] In drawing 1 , drawing 2 , and drawing 3 , 1 is a component case, and the ultrasonic transmission-and-reception wave component which is not illustrated contains it, and it is held at this component case 1. 2 and 3 are the crevices established in the left and right laterals of opening of the component case 1, respectively, and a crevice 2 and a crevice 3 have die length different, respectively, and are formed. 4 and 5 are housing and the hooks 6 and 7 formed in the shape of ** are formed in one edge of these housing 4 and 5, respectively. Hook 6 is formed in the die length corresponding to the die length of the crevice 2 established in the component case 1, hook 7 is formed in the die length corresponding to the die length of a crevice 3, and each die-length dimensions differ.
[0011] 8 is a cable and this cable 8 is connected to the ultrasonic transmission-and-reception wave component which is not illustrated. 9 is a sleeve and this sleeve 9 is the annular snap ring which acts the separation prevention which fits into the other-end section of the housing 4 which penetrated on the cable 8 and was united with it, and housing 5.
[0012] Actuation of ultrasonic ****** constituted as mentioned above is explained. First, the ultrasonic transmission-and-reception wave component which is not illustrated inside the component case 1 is contained, and the signal line which is not illustrated is connected, and housing 4 and housing 5 each other are faced, and it combines with them, and covers on opening of the component case 1.
[0013] In this case, the hook 6 first formed in housing 4 is put on the location which fits into the crevice 2 formed in the component case 1, similarly, the crevice 3 of the component case 1 is made to carry out fitting of the hook 7 formed in housing 5 next, and it is built into it. At this time, elastic deformation of hook 6 and the hook 7 is carried out, and they fit into a crevice 2 and a crevice 3, respectively. As shown in drawing 2 , since it fits into a crevice 2 and a crevice 3, respectively and location regulation is carried out, one edge surface part of housing 4 and housing 5 is united with the component case 1, and hook 6 and hook 7 are fixed.
[0014] The hook 6 of housing 4 is formed in the die length corresponding to the die length of the crevice 2 established in the component case 1 here. Since the hook 7 of housing 5 is formed in the die length corresponding to the die length of a crevice 3 and each die-length dimensions of hook 6 and hook 7 differ, In case housing 4 and housing 5 are inserted in the component case 1 and it fixes, it can easily and certainly fix, without mistaking the attachment direction.
[0015] Next, fitting of the sleeve 9 is carried out to the other-end section of housing 4 and housing 5, and it is equipped with it. Thereby, housing 4 and housing 5 are fixed to the component case 1 by one, without dissociating mutually. Drawing 3 is the perspective view showing the appearance in the condition that inclusion was completed, can use housing 4 and housing 5 as a bundle hand part, and can use them as ultrasonic ******.
[0016] Moreover, in case housing 4 and housing 5 are built into the component case 1, it can also fix beforehand with adhesives etc. if needed.
[0017] Furthermore, by making bulking agents, such as silicone rubber, intervene, simple liquid penetration prevention can be aimed at in the interface of the component case 1, housing 4, and housing 5, failure by liquid penetration etc. can be prevented to it, and high dependability can be realized to it.
[0018] In addition, although explained as electronic sector mold supersonic-wave ****** as a gestalt of this operation, the same effectiveness is acquired also when it is used having equipped ally mold supersonic-wave ****** or mechanical sector mold supersonic-wave ******.
[0019]
[Effect of the Invention] As mentioned above, in the crevice established in opening of a component case, since this invention is considering the projected part prepared in each of housing of a pair as the configuration fitted in and unified, it has the effectiveness that a component case and housing of a pair are firmly [easily and] fixable to one in a narrow tooth space.
[0020] Moreover, in case housing is inserted in a component case and it fixes by changing the die length of the hook

prepared in housing of a pair corresponding to the crevice of the component case which fits in, it has the effectiveness that it is easily and certainly fixable, without mistaking the attachment direction.

[0021] Furthermore, without completely using metal conclusion components, in housing, since a component case is fixable, high electric safety [/ near the analyte contact section] is obtained, the configuration of arbitration becomes possible also in appearance, and it has the effectiveness of not receiving constraint in the purpose for spending.

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CLAIMS

[Claim(s)]
[Claim 1] The ultrasound probe equipped with the housing member of the pair which a projected part is formed in one end face, and faces on one side face mutually, the component case where the crevice into which the above-mentioned projected part fits was formed when an ultrasonic transmission-and-reception wave component was contained inside and one end face of the housing member of a top Norikazu pair joined to opening, and the sleeve that fits into the other-end side of the housing member of the above-mentioned pair.
[Claim 2] The ultrasound probe according to claim 1 characterized by having the die length from which the projected part formed in one end face of the housing member of a pair differs, respectively.

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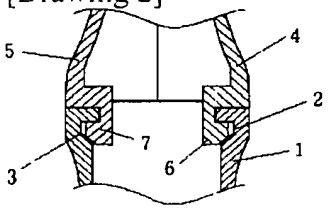
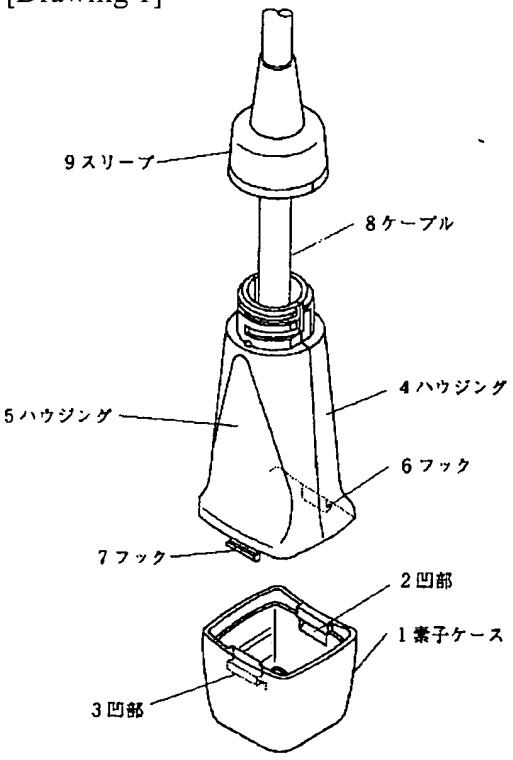
DRAWINGS

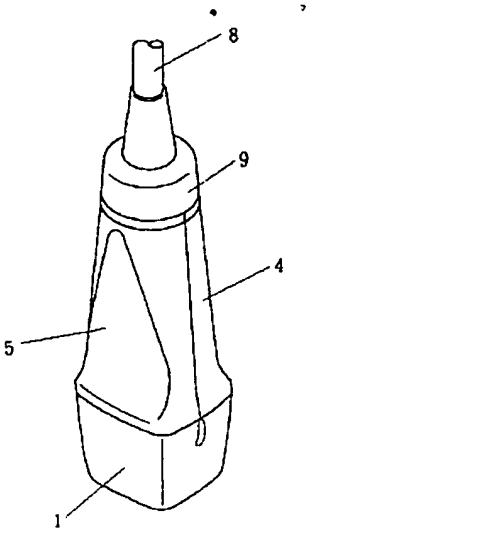
[Drawing 2]



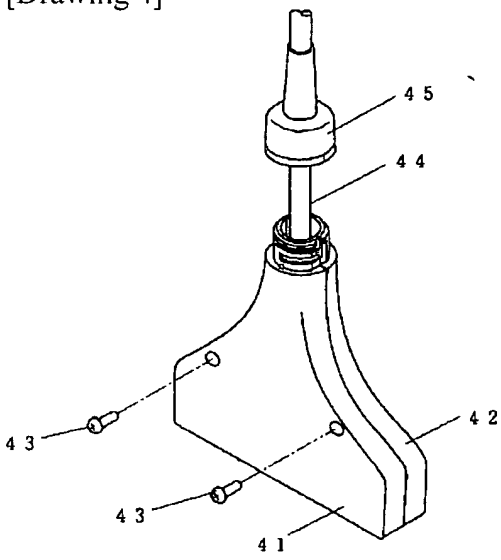
[Drawing 1]



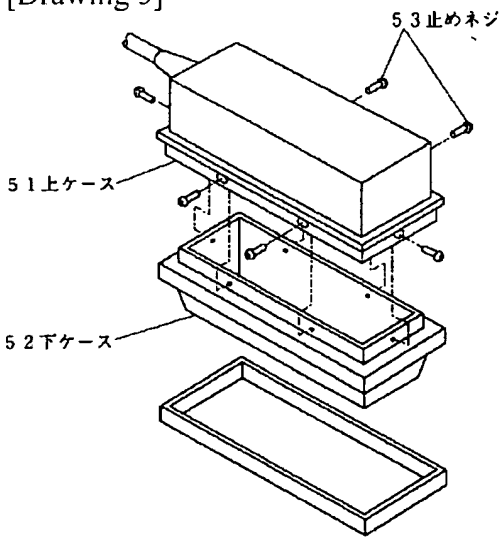
[Drawing 3]



[Drawing 4]



[Drawing 5]



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